

Flume Replacement Alignment Study

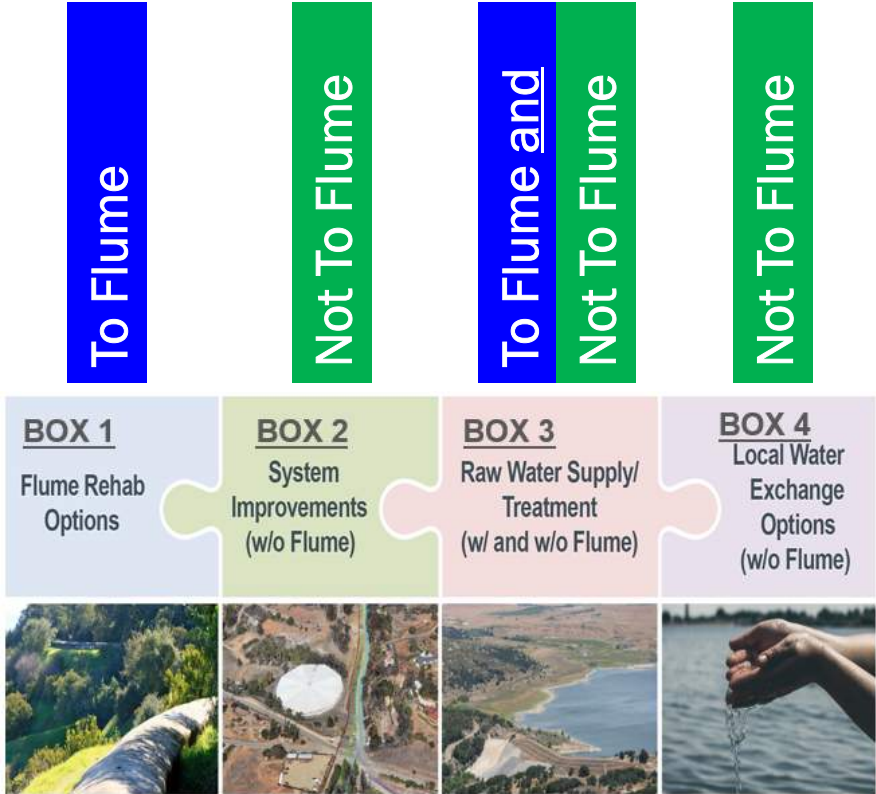
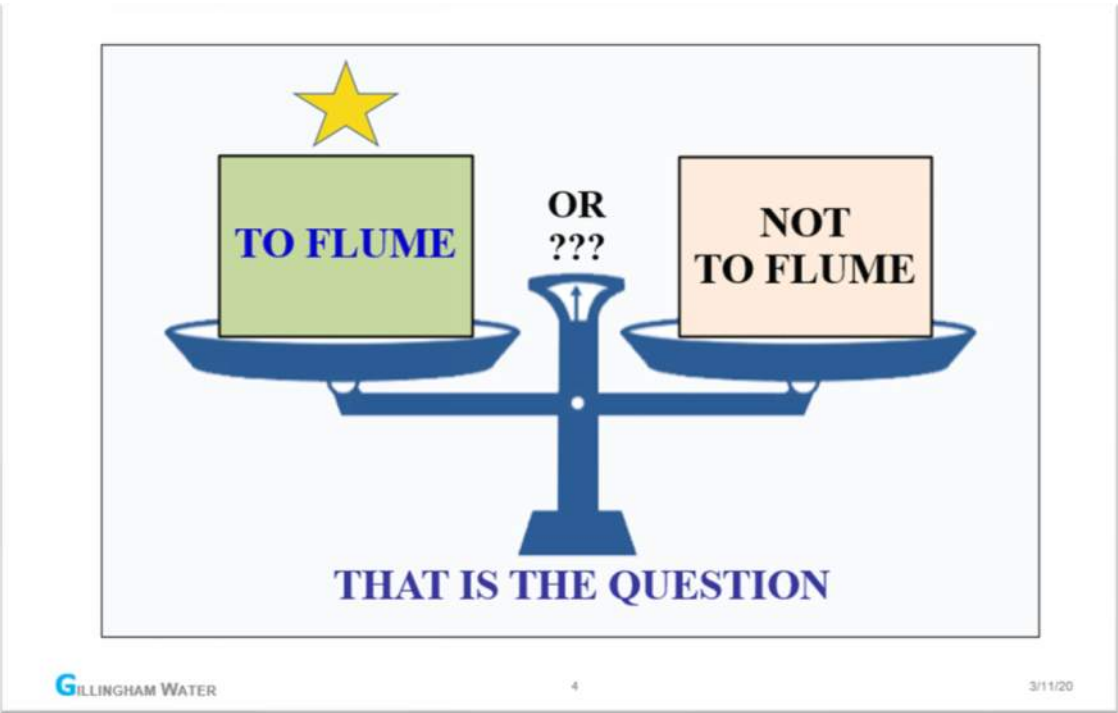
Board Workshop #3 – Fine Screening (Cont'd)

March 18, 2024

Defining the **next**
legacy



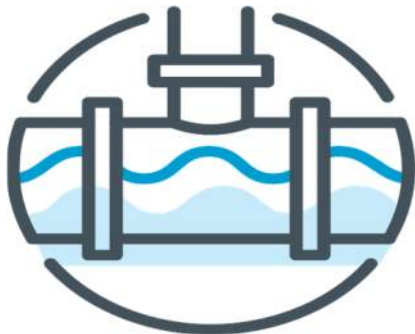
Where we came from: To Flume or Not to Flume?



Where are we headed: How to Flume?

PLANNING FACTORS:

- feasibility and cost-effective construction
- reliability
- environmental effects
- long-term operations and maintenance (O&M)
- affordability, impacts to rates, and funding options
- ***NEW*** predictive climatological modeling



RELIABLE



AFFORDABLE

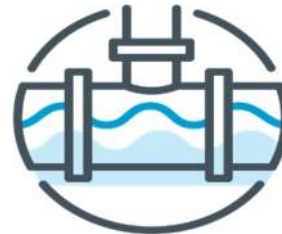


RESPONSIBLE

Where are we headed: How to Flume?

SUCCESS FACTORS:

- Consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation, per CEQA.
- Avoid surprises related to feasibility or cost that unexpectedly tips the scale on the “To Flume or Not to Flume” decision by regularly tracking pertinent cost data and preparing more detailed construction cost estimates.
- Support the District’s decision to replace the Flume by presenting a clear project roadmap in a preliminary design report that includes a project funding plan for the preferred alignment.



RELIABLE



AFFORDABLE



RESPONSIBLE

Fine screening recommends; Alternative #1 plus One Corridor

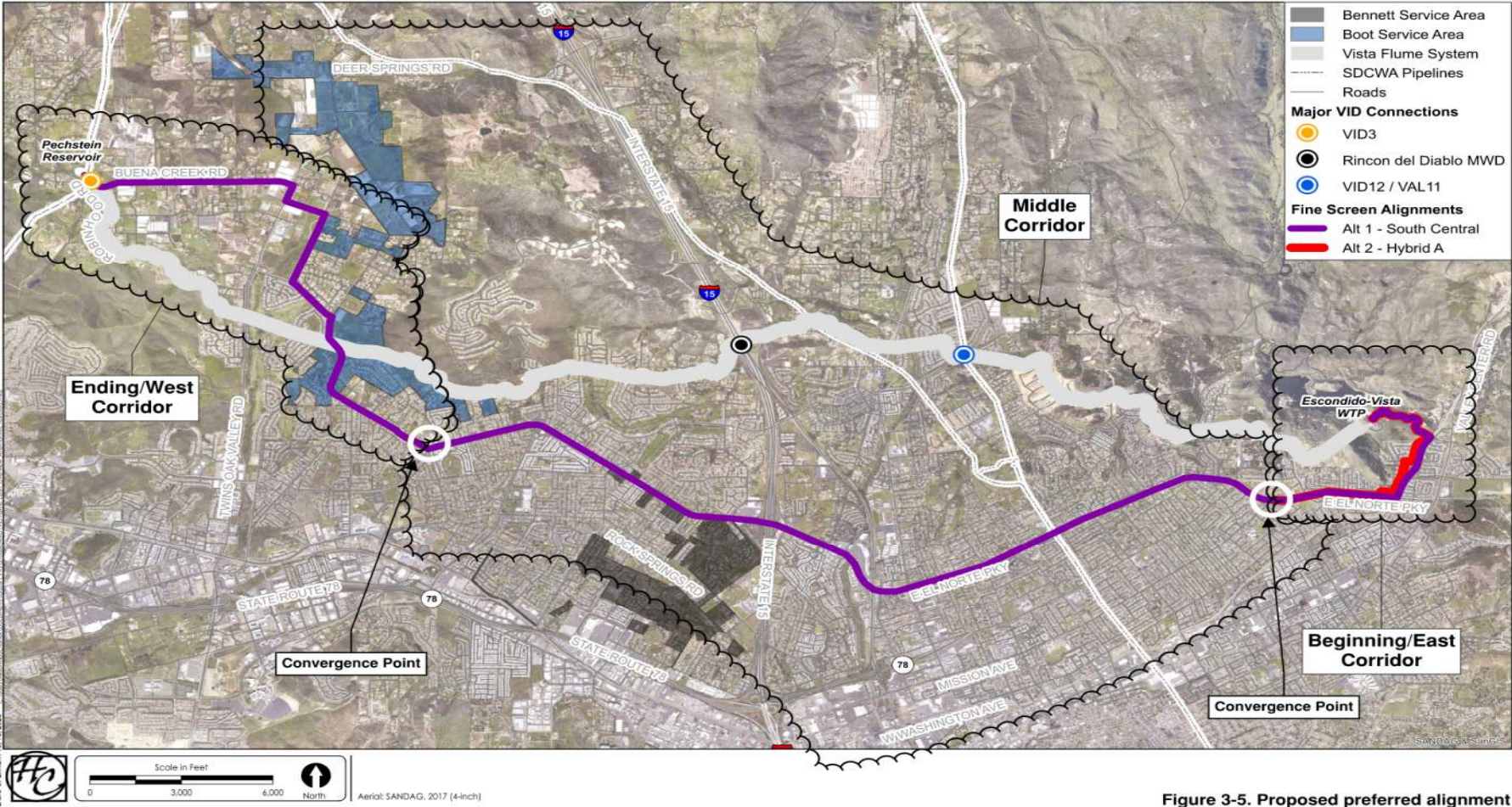


Figure 3-5. Proposed preferred alignment

Results – Predictive climatological modeling supports the To Flume decision for 80% of climate scenarios modeled.

Table 4-2. Possible Range of Local Water System Investment Scenarios

| Local Water System Investment Scenario | Capital Costs ^a | Anticipated Range of Average Annual Local Yield (AFY) ^{b,c} | | |
|---|----------------------------|--|---|---|
| | | Dry ^{b,c} (CMCC_CMS RCP8.5) | Baseline ^{b,c} (Historical) | Wet ^{b,c} (CanESM2 RCP8.5) |
| Scenario #1: Low-range <ul style="list-style-type: none"> Maintain wellfield as-is; no new wellheads No long-term in-lake HABs solution Respond to HABs using algaecide when needed No lake bypass pipeline or additional operational flexibility | \$8M | 1,700 | 2,500 | 3,000 |
| Scenario #2: HABs Control Only <ul style="list-style-type: none"> Replace wellheads as-needed to preserve historical yield Implement long-term in-lake HABs solution Preventative HABs control using chemical treatment No lake bypass pipeline or additional operational flexibility | \$13M | 1,900 | 2,700 | 3,300 |
| Scenario #3: Baseline or "Mid-Range" <ul style="list-style-type: none"> Optimize wellfield to achieve the historical, and can achieve sustainable yield over 12-months ^d Implement long-term in-lake HABs solution Preventative HABs control using chemical treatment No lake bypass pipeline or additional operational flexibility | \$23M | 4,700 | 5,600 | 7,500 |
| Scenario #4: Max. Allowable Sustainable Yield <ul style="list-style-type: none"> Maximize wellfield to achieve allowable sustainable yield ^e Implement long-term in-lake HABs solution Preventative HABs control using chemical treatment No lake bypass pipeline or additional operational flexibility | \$37M | 5,400 | 6,200 | 7,800 |
| Scenario #5: High-range <ul style="list-style-type: none"> Maximize wellfield to achieve allowable sustainable yield ^e Implement long-term in-lake HABs solution. Preventative HABs control using chemical treatments Install a lake bypass pipeline for additional operational flexibility | \$57M | 6,900 | 7,200 | 7,900 |

Take Aways

- Most climate futures, 80% of the modeled scenarios, predict the District can confidently rely on local water being available over a wide variety of climate conditions, and the economics weigh in favor of a To Flume project if modest investments are made to the Local Water System (LWS).
- Six of the 15 model runs (40%) predicted local yields greater than the Escondido-Vista Water Treatment Plant's (EVWTP's) current 40:60 local-to-imported water blend ratio limit, which would require additional investments in treatment system modifications to realize the full benefit of this additional yield.

Used as basis for affordability analysis

a. Capital costs presented are in 2023 dollars, and only include District's share of costs (e.g., 70% for wellfield projects and 50% for Henshaw projects).

b. District's share of the anticipated average annual local yield in AFY estimated for the corresponding modelled scenario.

c. The District's share of local yield presented herein are results from the predictive climatological model described above in Section 4.

d. Warner Basin's historical yield is -7,140 AFY which equates to a District share of -1,750 AFY.

e. Warner Basin's maximum allowable sustainable yield is 9,125 AFY, which equates to a District share of -2,400 AFY.

f. Legend:

- Red = Future Flume replacement project is not economically viable (VID LW yield is less than 2,700 AFY).
- Green = No modifications needed to Lake Wohlford or EWTP keeping to 40:60 Local-to-Imported water blend ratio.
- Yellow = Requires improvements to Lake Wohlford or EWTP to local yields which are more than the current 40:60 Local-to-Imported water blend ratio limitation.

30-Year NPV Cost Comparison



Avg. Local Yield
- Dry Climate Model -

4,700 AF/yr

SDCWA Escalation

Mid-Range

NPV / Ops. Term

30 Yrs

District
Discount Rate:

5.50%

Net Present Value (NPV) Analysis, in FY 2023 Dollars

NPV Cost Summary -- To Flume vs. Not To Flume

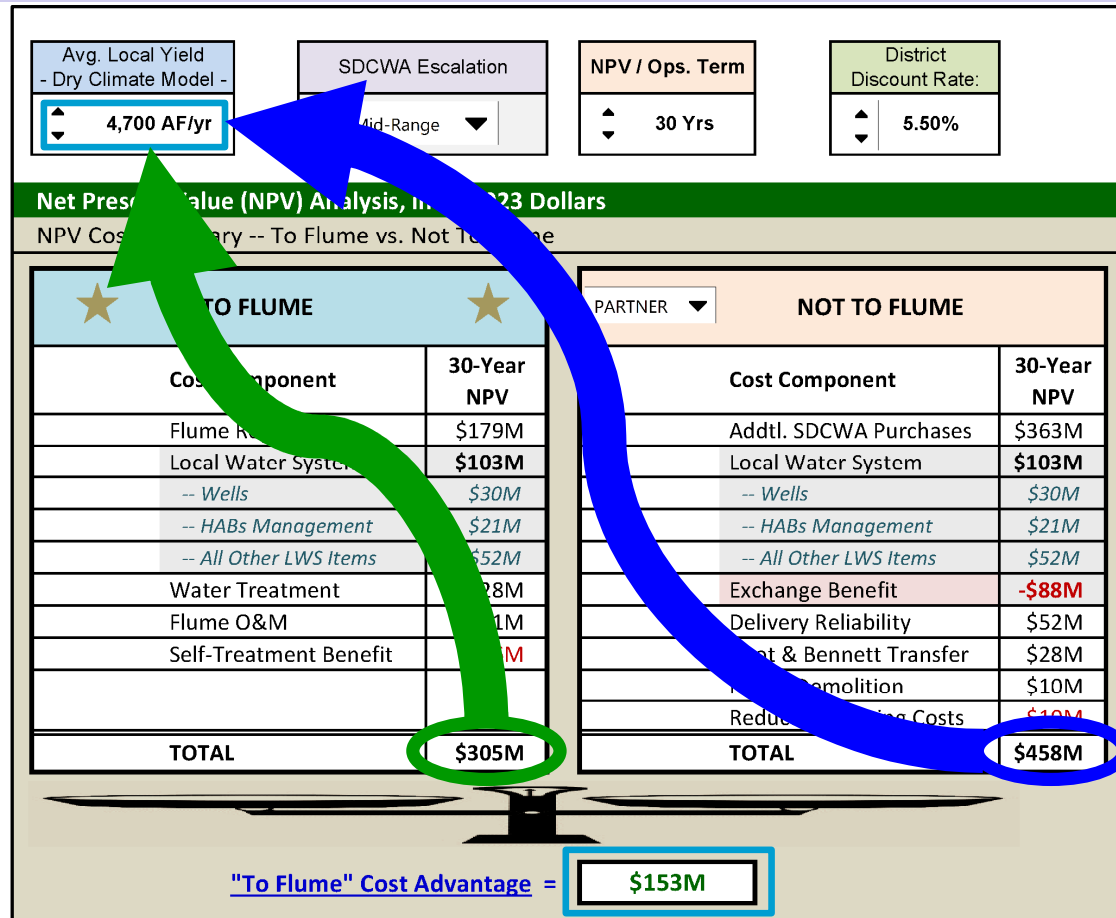
| ★ TO FLUME ★ | |
|------------------------|---------------|
| Cost Component | 30-Year NPV |
| Flume Replacement | \$179M |
| Local Water System | \$103M |
| -- Wells | \$30M |
| -- HABs Management | \$21M |
| -- All Other LWS Items | \$52M |
| Water Treatment | \$28M |
| Flume O&M | \$11M |
| Self-Treatment Benefit | -\$16M |
| TOTAL | \$305M |

| PARTNER NOT TO FLUME | |
|-------------------------|---------------|
| Cost Component | 30-Year NPV |
| Addtl. SDCWA Purchases | \$363M |
| Local Water System | \$103M |
| -- Wells | \$30M |
| -- HABs Management | \$21M |
| -- All Other LWS Items | \$52M |
| Exchange Benefit | -\$88M |
| Delivery Reliability | \$52M |
| Boot & Bennett Transfer | \$28M |
| Flume Demolition | \$10M |
| Reduced Pumping Costs | -\$10M |
| TOTAL | \$458M |

"To Flume" Cost Advantage = **\$153M**



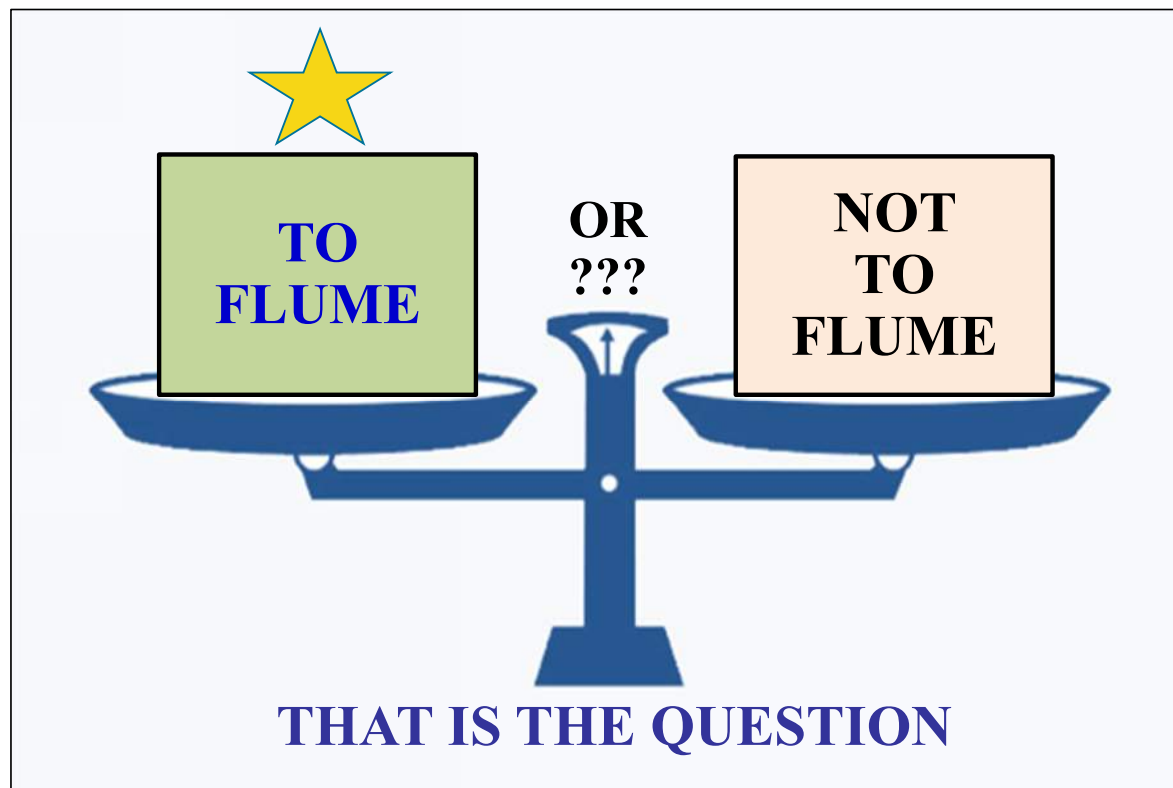
Cost per Acre-Foot Comparison



★
To Flume
\$2,200/AF

Not To Flume
\$3,200/AF

Despite escalating costs, need for financing, and future local water system investments, the decision To Flume still maintains the economic advantage.





Board's Requests from WS#3

- **Easement requirements for the recommended alignment alternative.**
- **Historical release data from Lake Henshaw.**
- **Projected San Diego County Water Authority rates for raw and treated water.**
- **Cost of water and yield comparisons with other local water projects.**
- **Effects of “To Flume” and “Not to Flume” projects on customer rates.**

Agenda

1. Workshop Objectives
2. Address Board Feedback from WS#3
3. Conclusions & Next Steps



Defining the **next**

legacy

1. Workshop Objectives

Speaker: J.P. Semper, P.E.



Defining the **next**

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Workshop Objectives

- Address Board's requests/feedback received at WS#3
 - A. Easement requirements for the recommended alignment alternative.
 - B. Historical release data from Lake Henshaw.
 - C. Projected San Diego County Water Authority rates for raw and treated water.
 - D. Cost of water and yield comparisons with other local water projects.
 - E. Effects of "To Flume" and "Not to Flume" projects on customer rates.
- Revisit conclusions and recommendations from WS#3
- Reach consensus on:
 - Advancing study to Phase 5 – Recommended Alignment Report

2. Address Board Feedback form WS#3

Speaker: J.P. Semper, P.E.



Defining the **next**

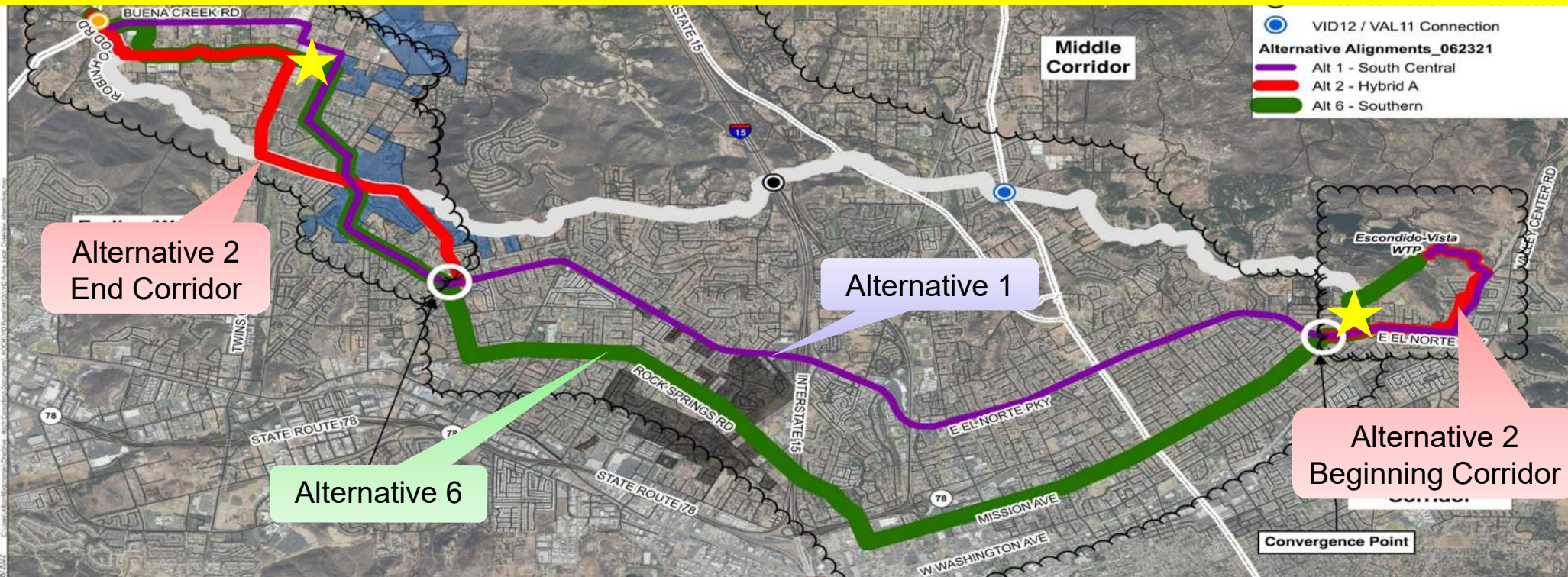
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A. Easement Requirements of Proposed Alignment

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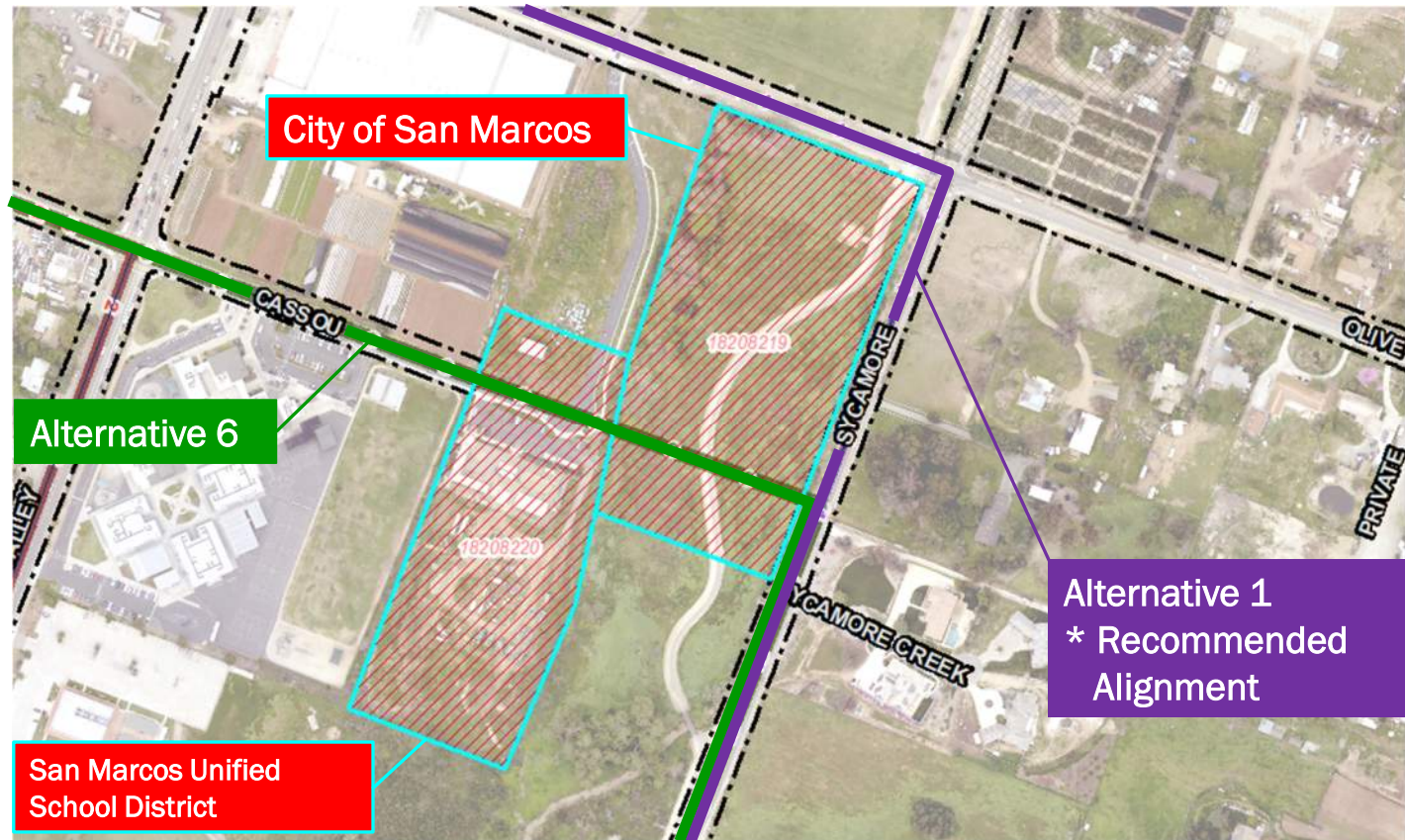
No permanent easements needed for Alt. #1 (recommended)

Two locations along Alt. #6 need easements



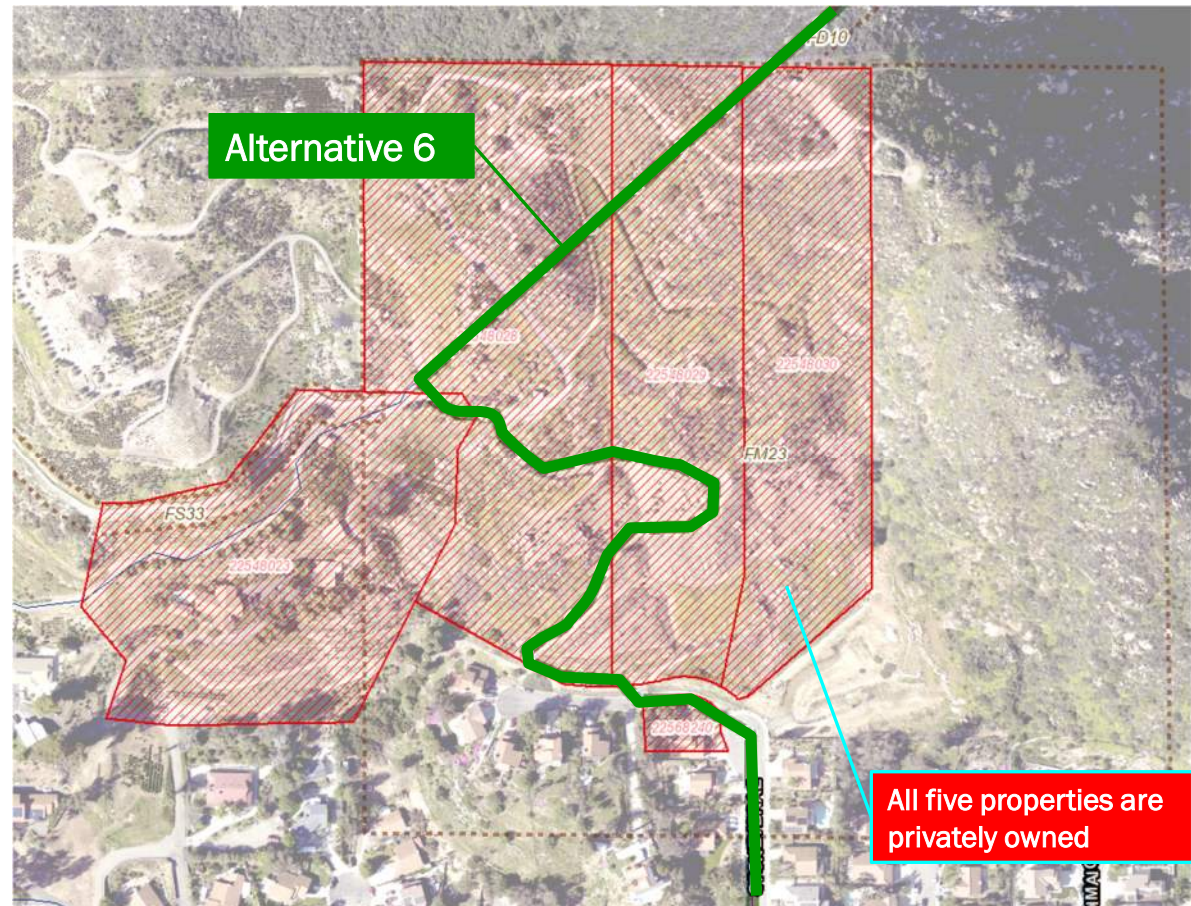
A. Easement Requirements of Proposed Alignment (cont'd)

- **Alt #6**, the “second place” alternative requires seven (7) new permanent easements;
 - (2) new permanent easements on the western portion
 - (5) new permanent easements on the eastern portion



A. Easement Requirements of Proposed Alignment (cont'd)

- **Alt #6**, the “second place” alternative requires seven (7) new permanent easements;
 - (2) new permanent easements on the western portion
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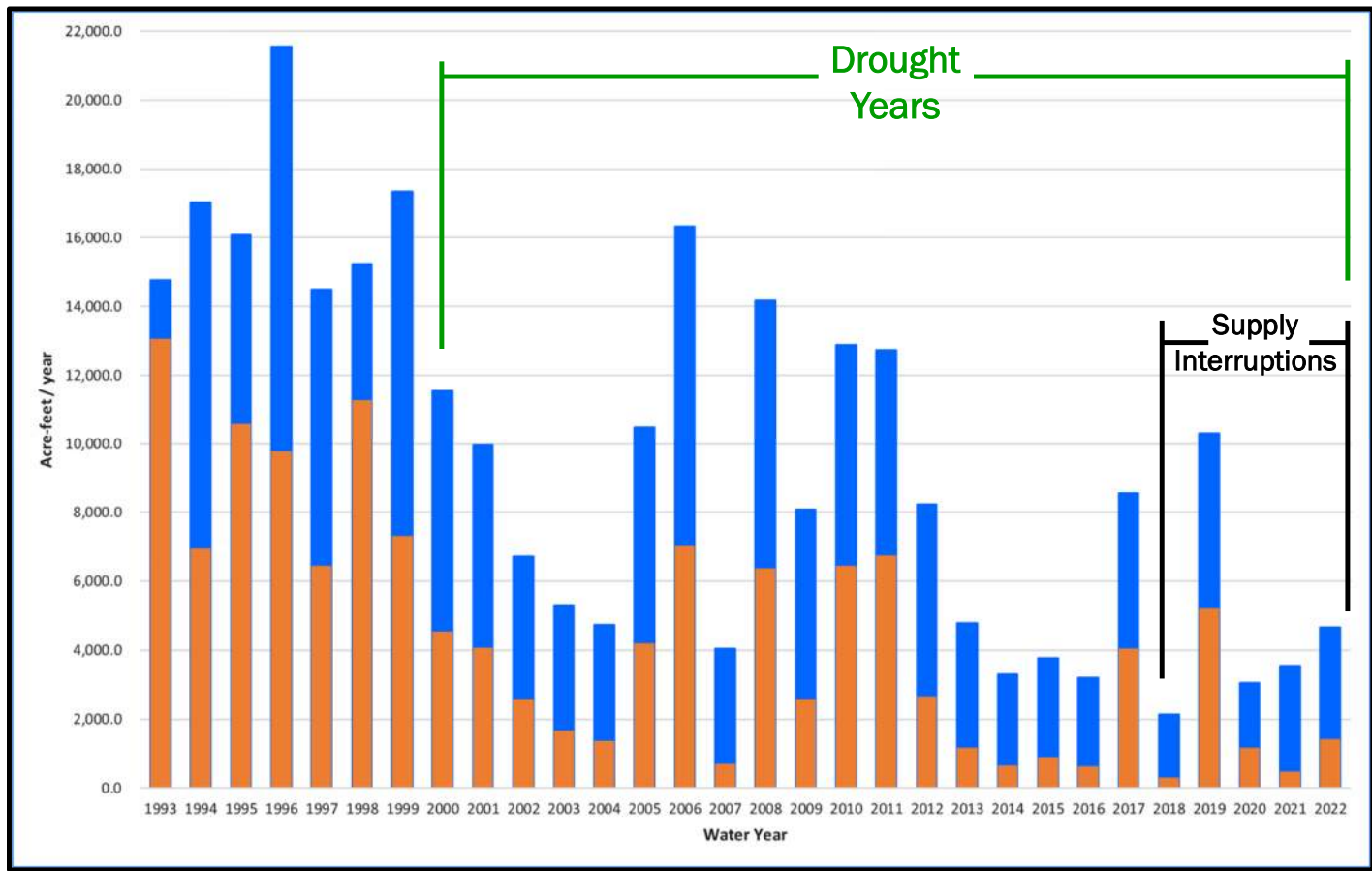
B. Historical Release Data from Lake Henshaw

B. Historical Release Data from Lake Henshaw

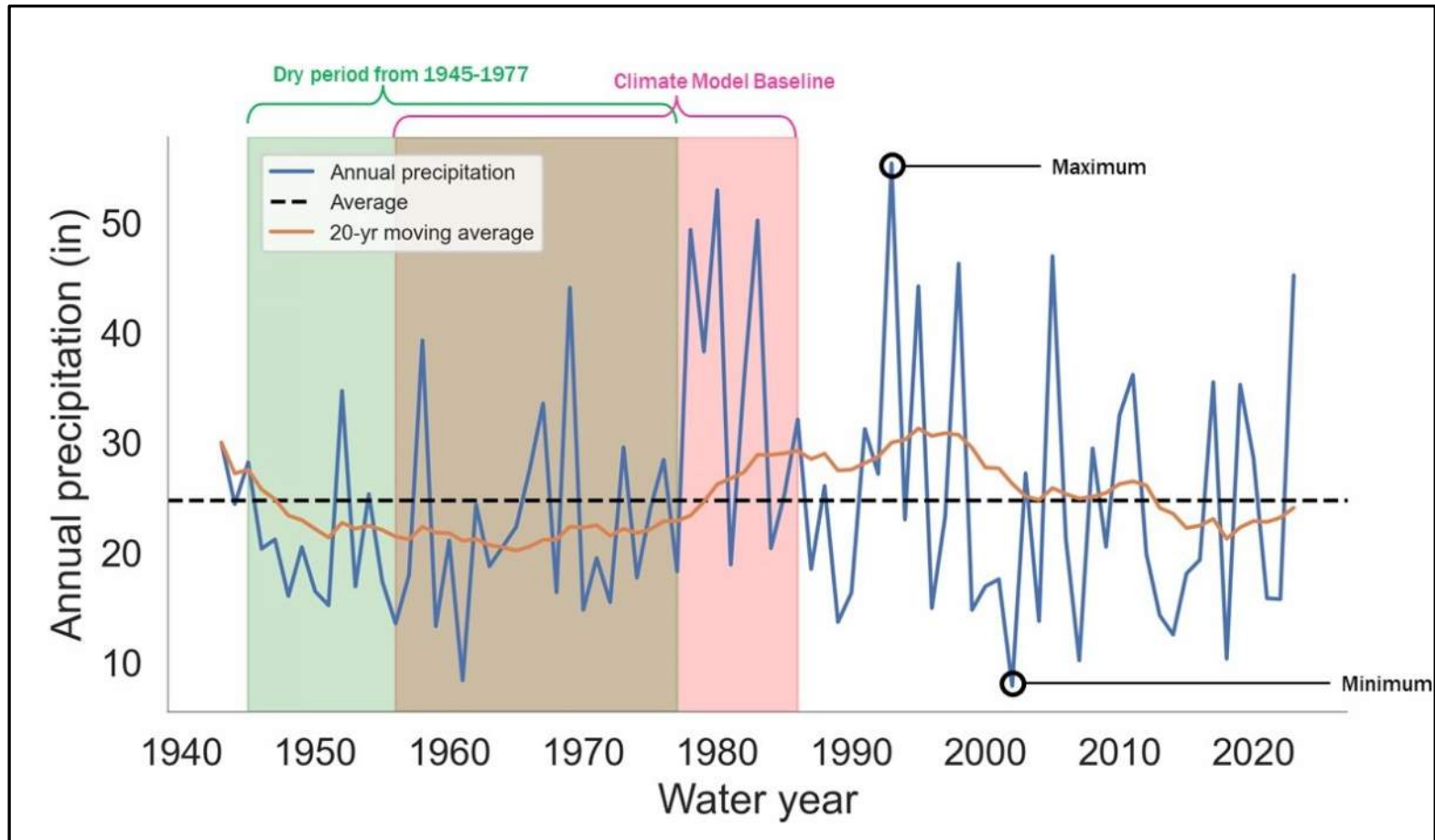
30-year Annual Averages

Lake Henshaw Releases
9,640 af/yr

Local Water to VID
4,400 af/yr



Study Precipitation to Establish a Climate Model Baseline



C. Projected CWA Rates for Raw & Treated Water

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Alternative:

Finance Planning Work Group Recommended Calendar Year 2024 Rates and Charges

| <i>FPWG Recommended Summary of Water Authority Rates and Charges</i> | | |
|---|------------------------|---------------------------------|
| Water Authority Rates and Charges | CY 2023 Adopted | CY 2024 FPWG Recommended |
| Melded Supply Rate (\$/AF) | \$1,085 | \$1,200 |
| Melded Treatment Rate (\$/AF) | \$350 | \$400 |
| Transportation Rate (\$/AF) | \$173 | \$189 |
| Untreated Permanent Special Agricultural Water Rate (\$/AF) | \$855 | \$903 |
| Treated Permanent Special Agricultural Water Rate (\$/AF) | \$1,205 | \$1,303 |
| Infrastructure Access Charge ² | \$4.24/ME | \$4.41/ME |
| Customer Service Charge | \$26,000,000 | \$28,600,000 |
| Storage Charge | \$60,000,000 | \$63,000,000 |
| Supply Reliability Charge | \$40,850,000 | \$43,400,000 |
| Standby Availability Charge per parcel or acre, whichever is greater ¹ | \$10 | \$10 |
| System Capacity Charge ² | \$5,700/ME | \$5,700/ME |
| Treatment Capacity Charge ² | \$159/ME | \$159/ME |
| Annexation Application Fee (Per Application) | \$11,556 | \$11,556 |

¹ Fiscal Year Charge.
² ME (meter equivalent) as defined in the resolution establishing the IAC.

+ 10.6% increase (untreated)

+ 14.3% increase (treated)

+ 9.2% increase (transport)

Must account for all other 'Charges' that apply to VID

C. Projected CWA Rates for Raw & Treated Water (cont'd)

| Based on CY24 CWA Board Adoption | Rate (\$/AF) | CY '24 Annual Charge (\$/yr) | VID' Annual CWA Water Purchases (AFY) |
|--|----------------------------|------------------------------------|---|
| Untreated Merged Supply Rate | \$ 1,200 | | |
| Transportation Rate | \$ 189 | | |
| Infrastructure Access Charge | \$ 137 | \$ 1,888,188 | 13,738.50 |
| Customer Service Charge Allocation | \$ 74 | \$ 1,013,264 | |
| Storage Charge Allocation | \$ 173 | \$ 2,382,111 | |
| Supply Reliability Charge | \$ 118 | \$ 1,618,003 | |
| Capacity Charge Allocation | \$ 22 | \$ 305,983 | |
| Readiness to Serve Charge | \$ 29 | \$ 399,707 | |
| <i>Merged Cost of 'Charges'</i> | <i>\$ 554</i> | | |
| CY24 Untreated (Raw) Water Rate | \$ 1,943 /AF all-in | | |
| Merged Treatment Rate | \$ 400 | | |
| CY24 Treated Water Rate | \$ 2,343 /AF all-in | | |

C. Projected CWA Rates for Raw & Treated Water (cont'd)

- CWA projected rates are uncertain
- Rate redesign was approved at CWA's Feb. '24 Board Meeting
- Anticipated year-over-year volatility for VID's rates is low, but steady rate increases will continue
- MWD rate increases 13% in 2024, 8% in 2025, with increases totaling 46% over the next 5 years

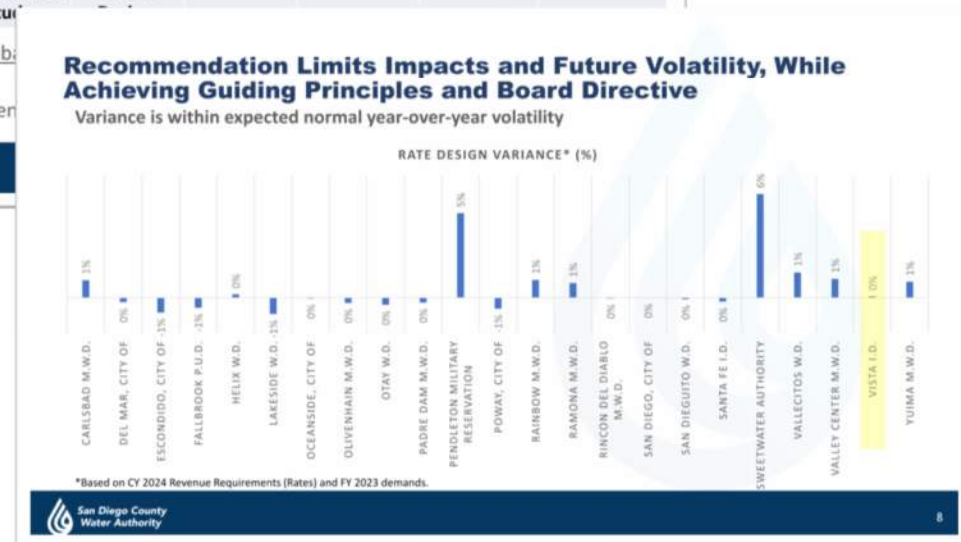
MARW and FPWG's Interim CY 2025 Rate Redesign Recommendation

| | Transportation | Treatment | Supply | Customer Service | Supply Reliability | Storage | Fixed Revenue % |
|----------------|---|---|--|------------------|--------------------|--------------------|-----------------|
| Existing | 100% Variable | 100% Variable | 100% Variable | 3-year Average | 5-year M&I Average | 3-year M&I Average | ~26% |
| Recommendation | 60% Variable/ 40% Fixed; 7-year Average | No change, pending Treatment Optimization Study | No change, pending Water Portfolio Study | 7-year Average | 7-year M&I Average | 7-year M&I Average | CY'25 - 29.4% |

CY 2025 Recommendation is based on:

- Guiding Principles
- Enhance Fixed Revenue

San Diego County Water Authority

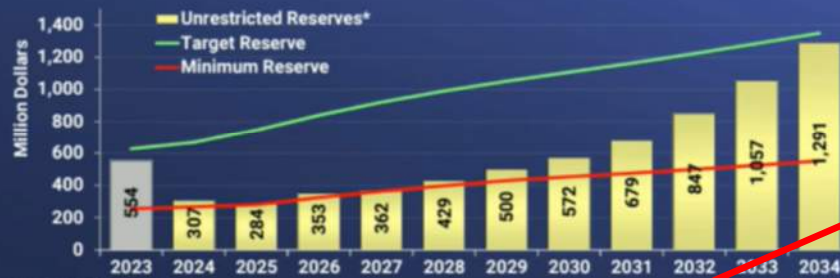


C. Projected CWA Rates for Raw & Treated Water (cont'd)

MWD's Proposed 2025 & 2026 Budget & Rate Increases

With \$5B Pure Water Southern California implementation costs between 2027 and 2034 included

Proposed FY 2024/25 & FY 2025/26 Budget Projected Rate Increases and Financial Metrics



| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|-----------------------------------|------|------|-------|------|-------|-------|-------|-------|-------|-------|------|------|
| Overall Rate Inc. | 5% | 5% | 13.0% | 8.0% | 12.0% | 8.0% | 5.0% | 5.0% | 4.0% | 4.0% | 4.0% | 4.0% |
| Water Transactions (MAF)** | 1.42 | 1.17 | 1.44 | 1.44 | 1.44 | 1.45 | 1.46 | 1.46 | 1.47 | 1.49 | 1.51 | 1.53 |
| Rev. Bond Cvg | 1.5 | 1.1 | 1.4 | 1.8 | 1.7 | 1.9 | 1.9 | 1.8 | 1.8 | 1.7 | 1.7 | 1.7 |
| CIP, \$M | 247 | 353 | 312 | 324 | 1,390 | 1,684 | 2,171 | 1,966 | 1,544 | 1,091 | 655 | 502 |
| PAYGO, \$M | 135 | 35 | 125 | 175 | 175 | 250 | 275 | 275 | 250 | 225 | 200 | 200 |

+ 46%
Over next 5-years

D. Cost of Water & Yield Comparison with Other Local Projects

Cost of Water on the Balance Scale

| Avg. Local Yield - Dry Climate Model - 4,700 AF/yr | SDCWA Escalation Mid-Range | NPV / Ops. Term 30 Yrs | District Discount Rate: 5.50% |
|---|-------------------------------|---------------------------|-------------------------------------|
| Net Present Value (NPV) Analysis, in FY 2023 Dollars | | | |
| NPV Cost Summary -- To Flume vs. Not To Flume | | | |
| ★ TO FLUME ★ | | PARTNER | NOT TO FLUME |
| Cost Component | 30-Year NPV | Cost Component | 30-Year NPV |
| Flume Replacement | \$179M | Addtl. SDCWA Purchases | \$363M |
| Local Water System | \$103M | Local Water System | \$103M |
| -- Wells | \$30M | -- Wells | \$30M |
| -- HABs Management | \$21M | -- HABs Management | \$21M |
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| Water Treatment | \$28M | Exchange Benefit | -\$88M |
| Flume O&M | \$11M | Delivery Reliability | \$52M |
| Self-Treatment Benefit | -\$16M | Boot & Bennett Transfer | \$28M |
| | | Flume Demolition | \$10M |
| | | Reduced Pumping Costs | -\$10M |
| TOTAL | \$305M | TOTAL | \$458M |

Capital cost of Flume replacement

Capital and operating costs pertaining to LWS

- replace & optimize wellfield

- long term HABs mitigation

- annual O&M; includes algaecide, sediment sealing, canal and dam maintenance, etc.

Capital and O&M costs for treating local water at EVWTP

O&M cost associated with Flume

Cost saving for taking additional local yield and avoiding treated water purchases

30-year Purchase of treated water equal to local yield offset (avg. \$2,600/AF)

Same as To Flume (left)

Revenue earned by selling VID's share of local Yield to Escondido

Additional infrastructure required (isolation valves, additional storage, etc.) so VID can convert system to rely 100% on CWA Treated Water

Cost to transfer aged assets to Vallecitos

Demolish Flume, specifically where slope stabilities and public safety is a concern.

Cost savings from avoided pumping costs due to higher CWA delivery pressures

Not To Flume Needs Multiple Interagency Agreements to be Successful:

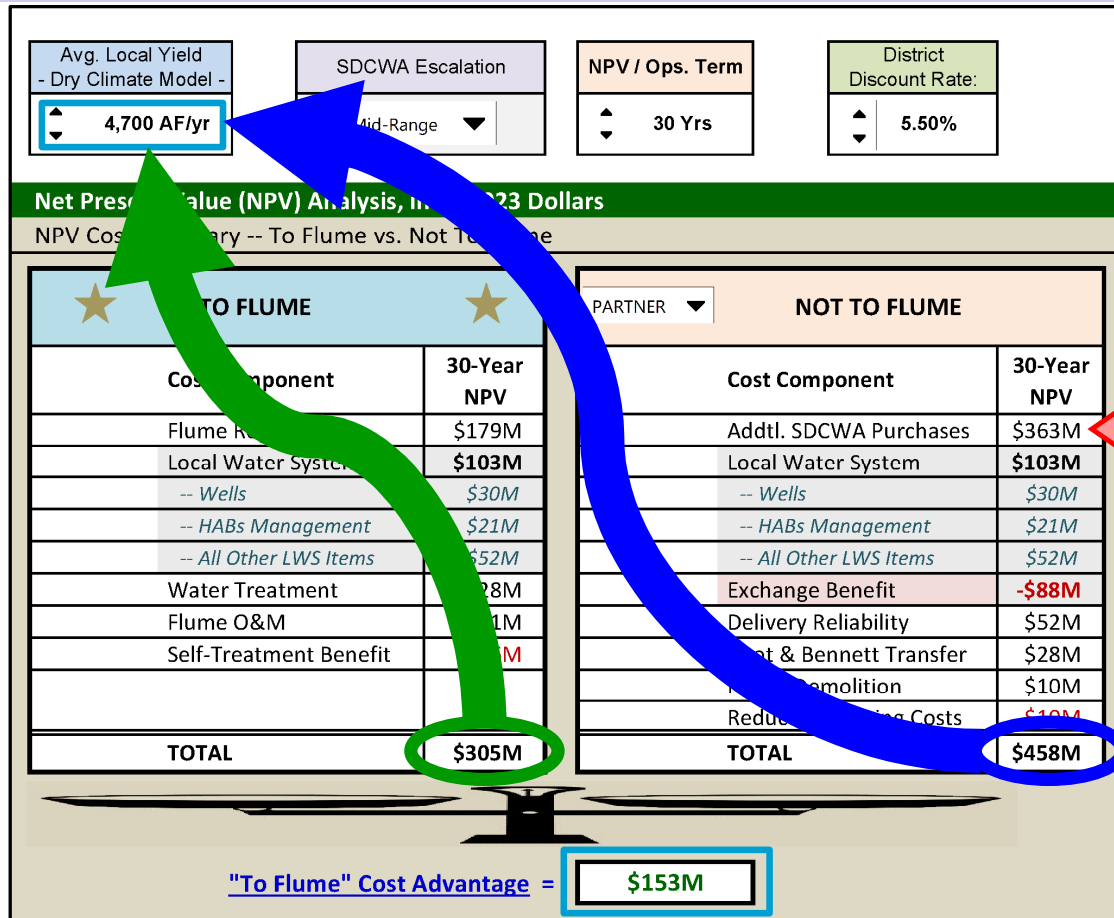
Exchange Benefit: requires agreement with Escondido to purchase local water & walk-away from EVWTP

Delivery Reliability: requires agreement with CWA to construct Isolation Valves and limit shutdown durations

Boot & Bennett Transfer: requires agreement with Vallecitos

Flume Demolition: requires permanently disconnecting Rincon's backup feed from Flume

Cost per Acre-Foot Comparison (Mid-Range)

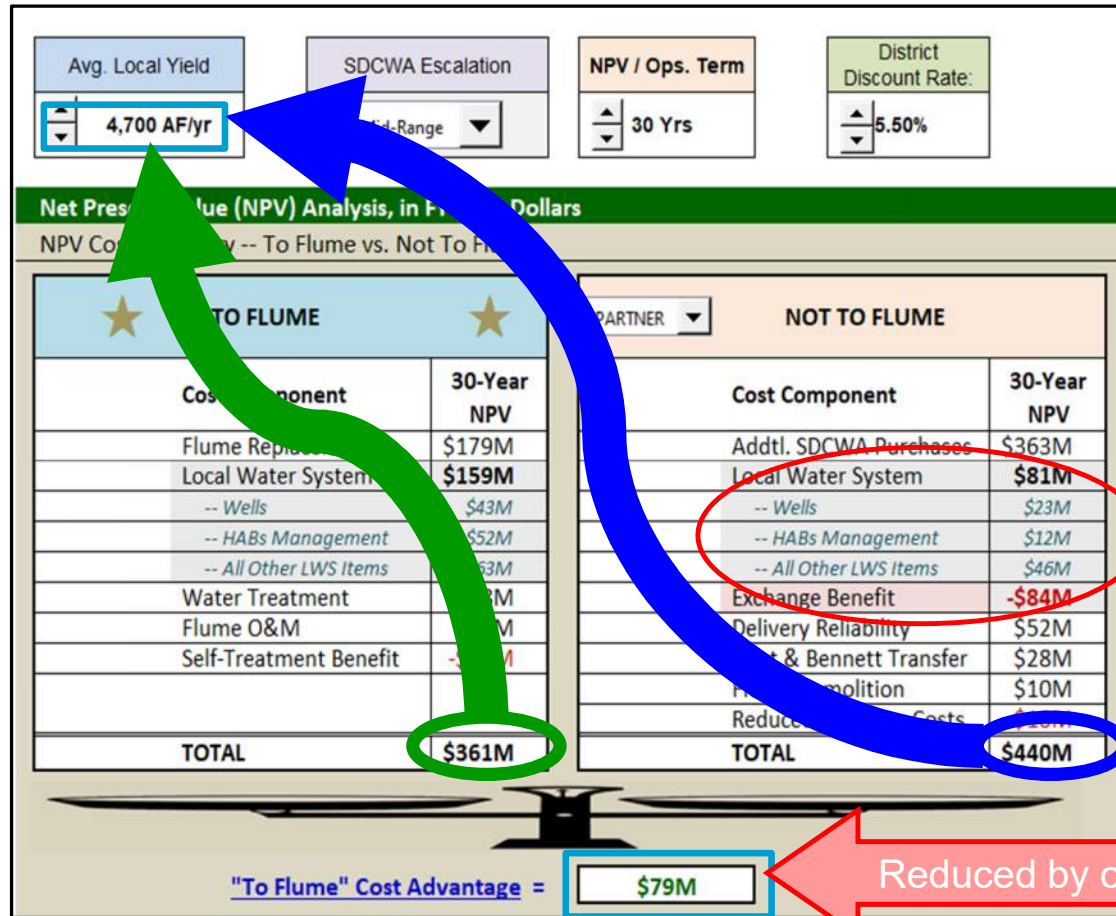


Average \$2,600/AF Treated Rate

★
To Flume
\$2,200/AF

Not To Flume
\$3,200/AF

Cost per Acre-Foot Comparison (Pessimistic)



To Flume
\$2,200/AF

+\$400/AF

To Flume
\$2,600/AF

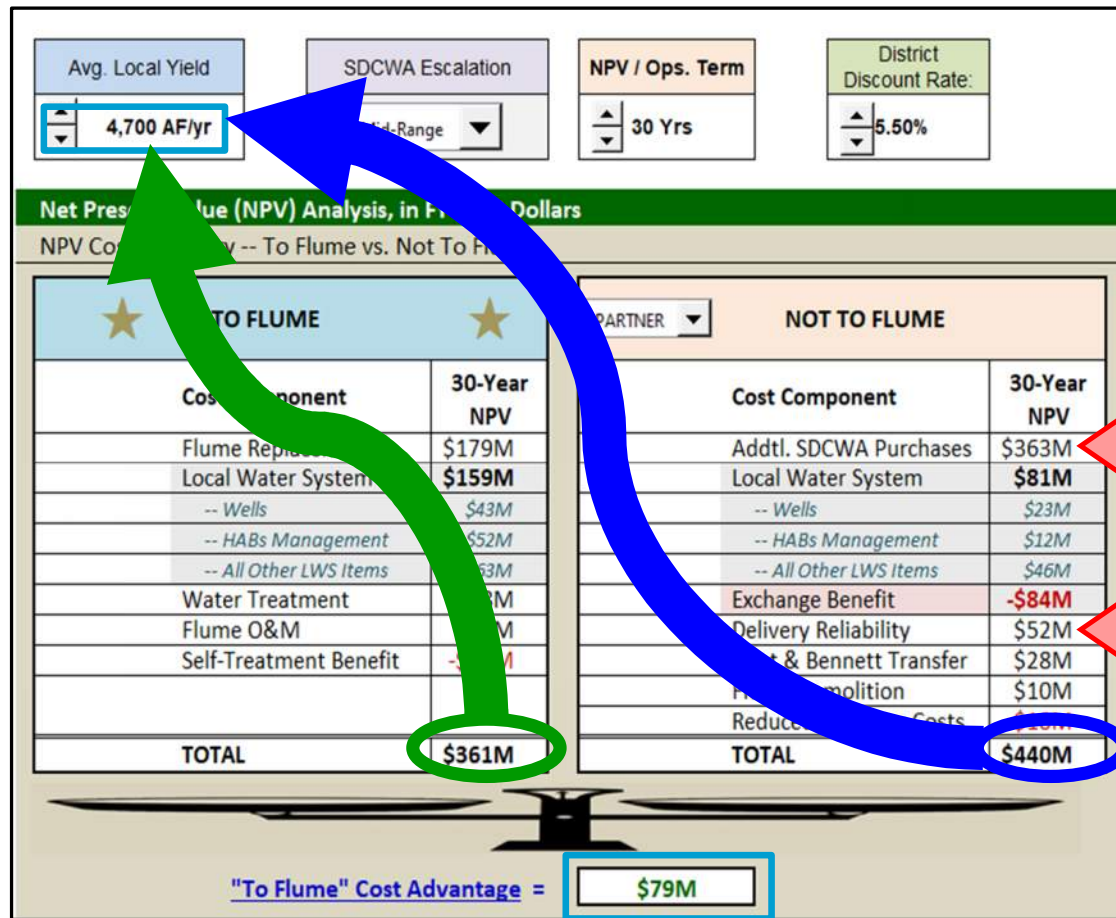


Not To Flume
\$3,200/AF

(-) \$100/AF

Not To Flume
\$3,100/AF

Consider this, the keys to a true low cost Not to Flume...



To Flume
\$2,600/AF

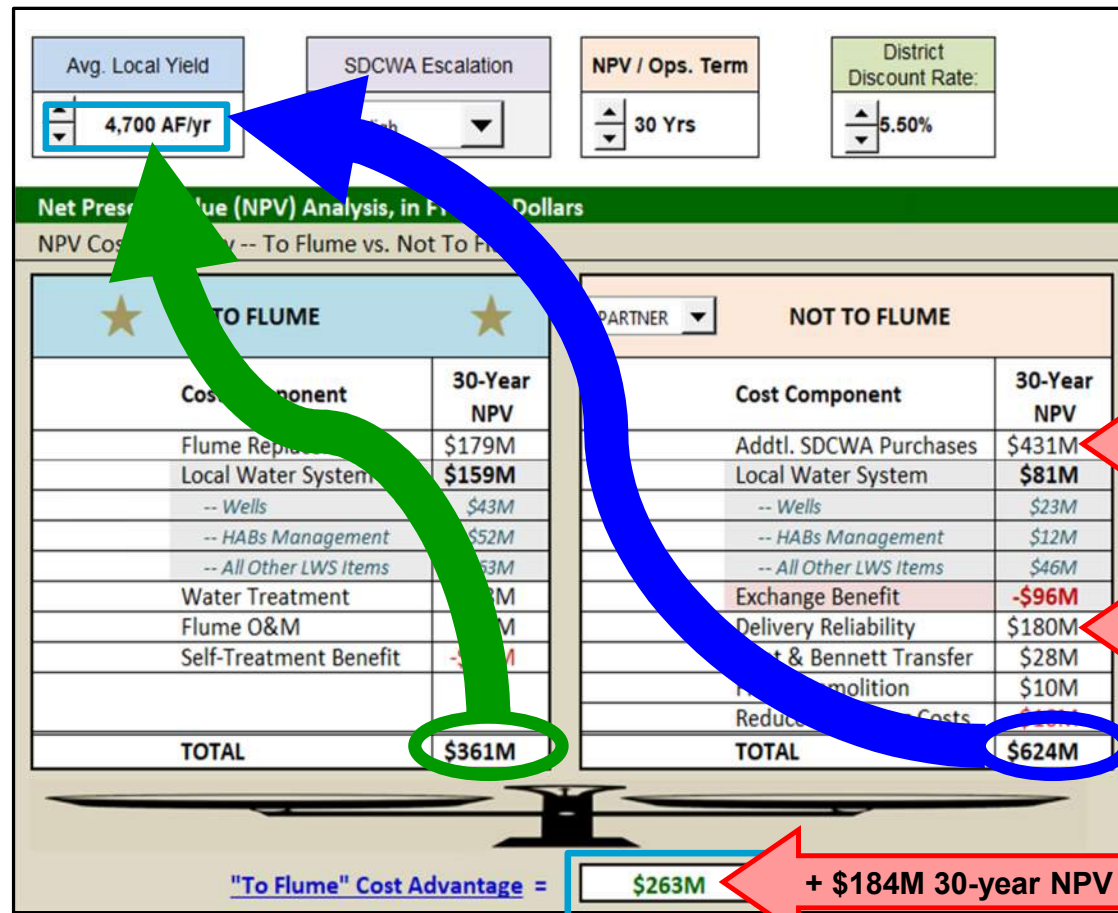


Previously 30-year Avg. Treated Water Rate was ~2,600/AF

Requires SDCWA completes Isolation Valves Project

Not To Flume
\$3,100/AF

Cost per Acre-Foot Comparison (What's Plausible?)



To Flume
\$2,600/AF



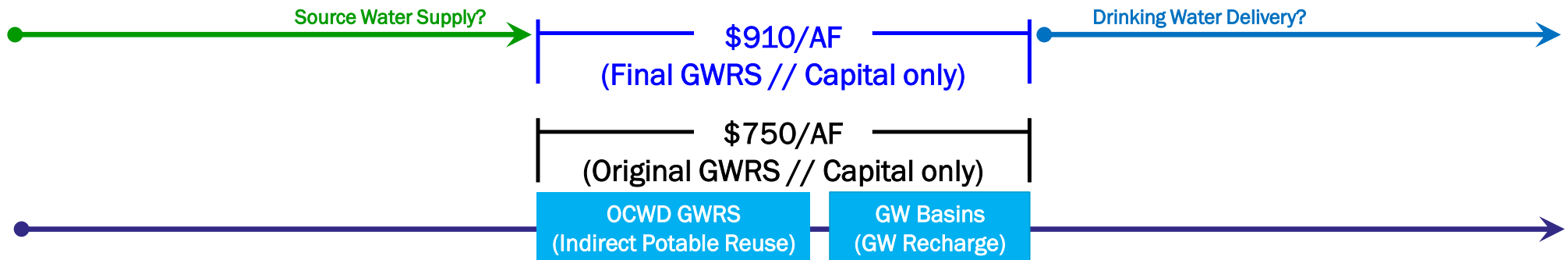
+ \$68M 30-year NPV
Using the recent foreseeable SDCWA rate increases

+ \$128M 30-year NPV
w/o isolation valves storage requirements increase x3

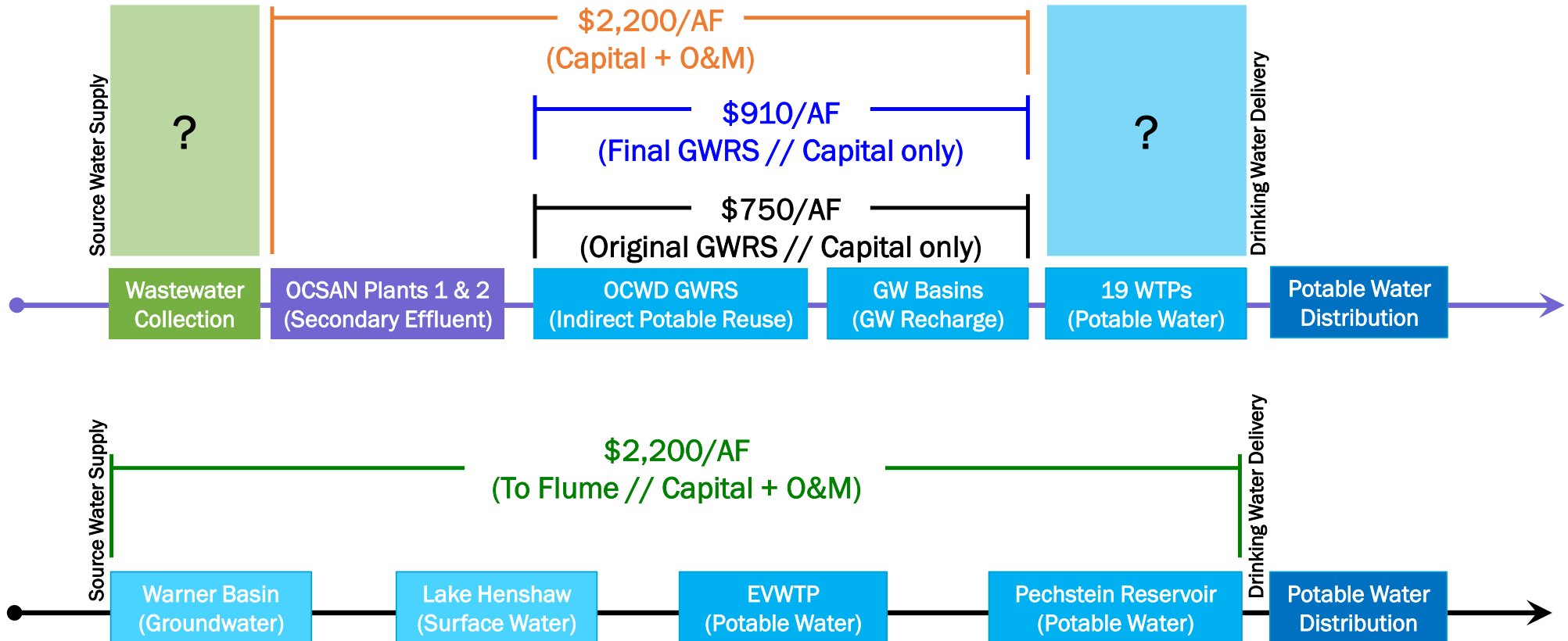
Not To Flume
\$4,400/AF

+ \$184M 30-year NPV

Cost of Water for Other Local Projects



Cost of Water for Other Local Projects



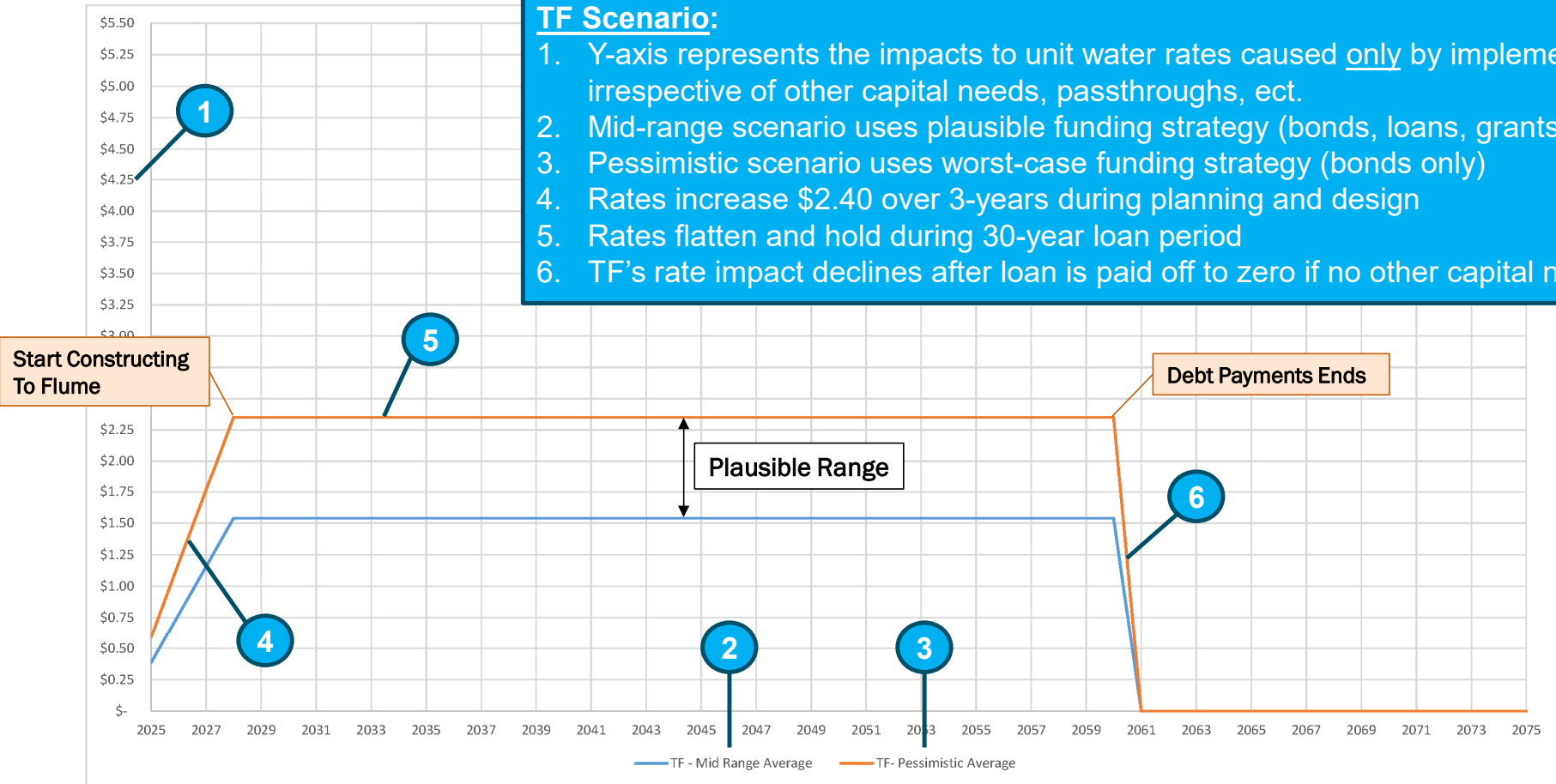
Cost of Water for Other Local Projects

| Local Project | Source Water & Point of Water Delivery | Yield Produced (AFY) | Cost of Water (\$/AF) |
|---|--|----------------------|-----------------------|
| OCWD Groundwater Replenishment System | Tertiary effluent from OCSAN Plants 1 & 2 → Groundwater Recharge // 4 Basins in Anaheim | 133,900 | \$2,200/AF |
| City of San Diego Pure Water Program | Wastewater redirected from Point Loma WWTP → Surface Water Augmentation // Lake Miramar | 30,900 | \$3,600/AF |
| East County Advanced Water Purification Project | Wastewater received at Padre Dam WRF → Surface Water Augmentation // Lake Jennings | 11,300 | \$4,300/AF |
| Encina One Water North San Diego | Tertiary effluent from Encina WPCF → Surface Water Augmentation // Lake Hodges | 18,100 | \$4,100/AF |
| Pure Water Oceanside | Tertiary effluent from San Luis Rey WWTP → Groundwater Recharge // Mission Basin | 3,100 | \$2,800/AF |
| VID To Flume | Warner Basin Wellfield and Lake Henshaw → Potable Water Distribution // Pechstein Reservoir | 4,700 | \$2,200/AF |
| VID Not To Flume | SDCWA Treated Water → Potable Water Distribution // Pechstein Reservoir | 4,700 | \$3,100/AF |

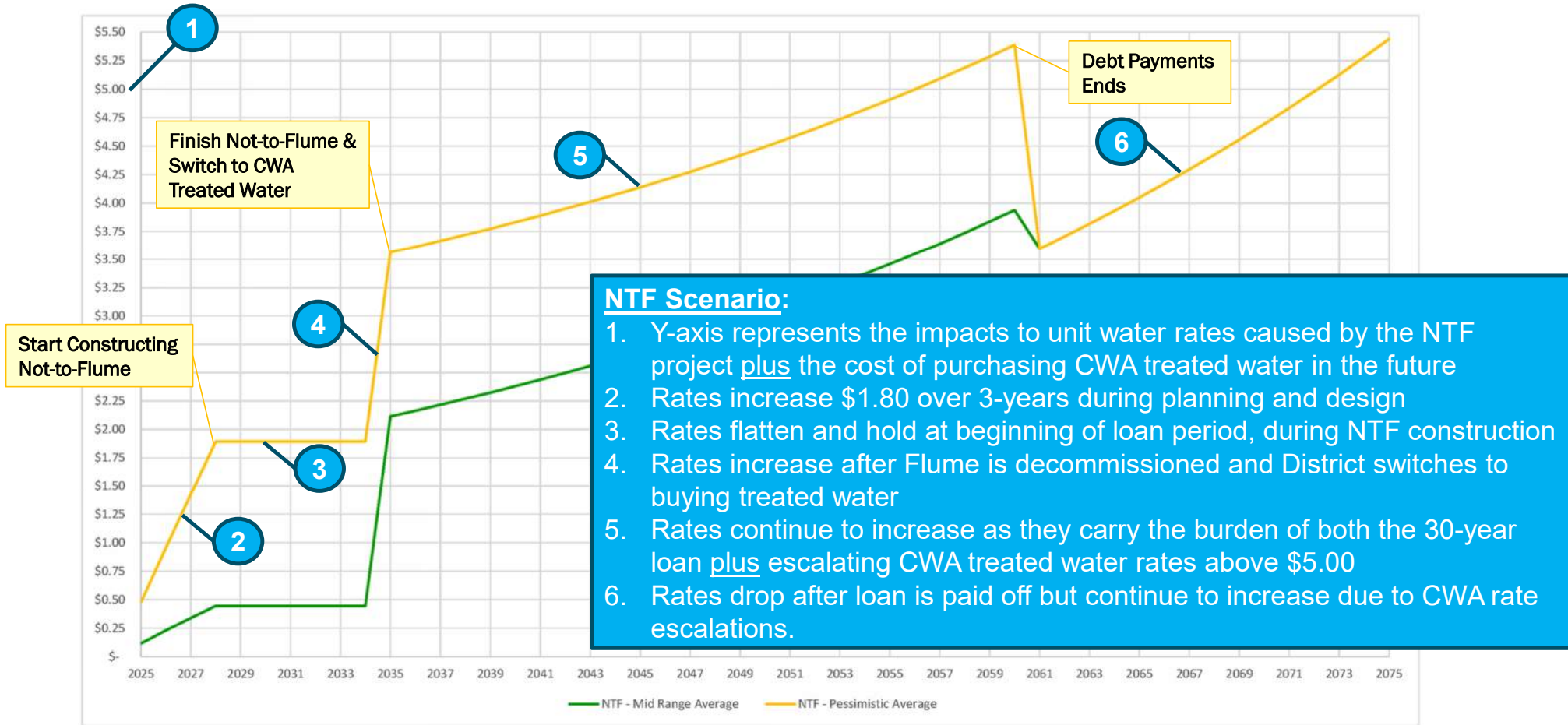
E. Effects of To Flume (TF) & Not To Flume (NTF) Projects on Customer Rates

E. Effects of TF & NTF Projects on Customer Rates

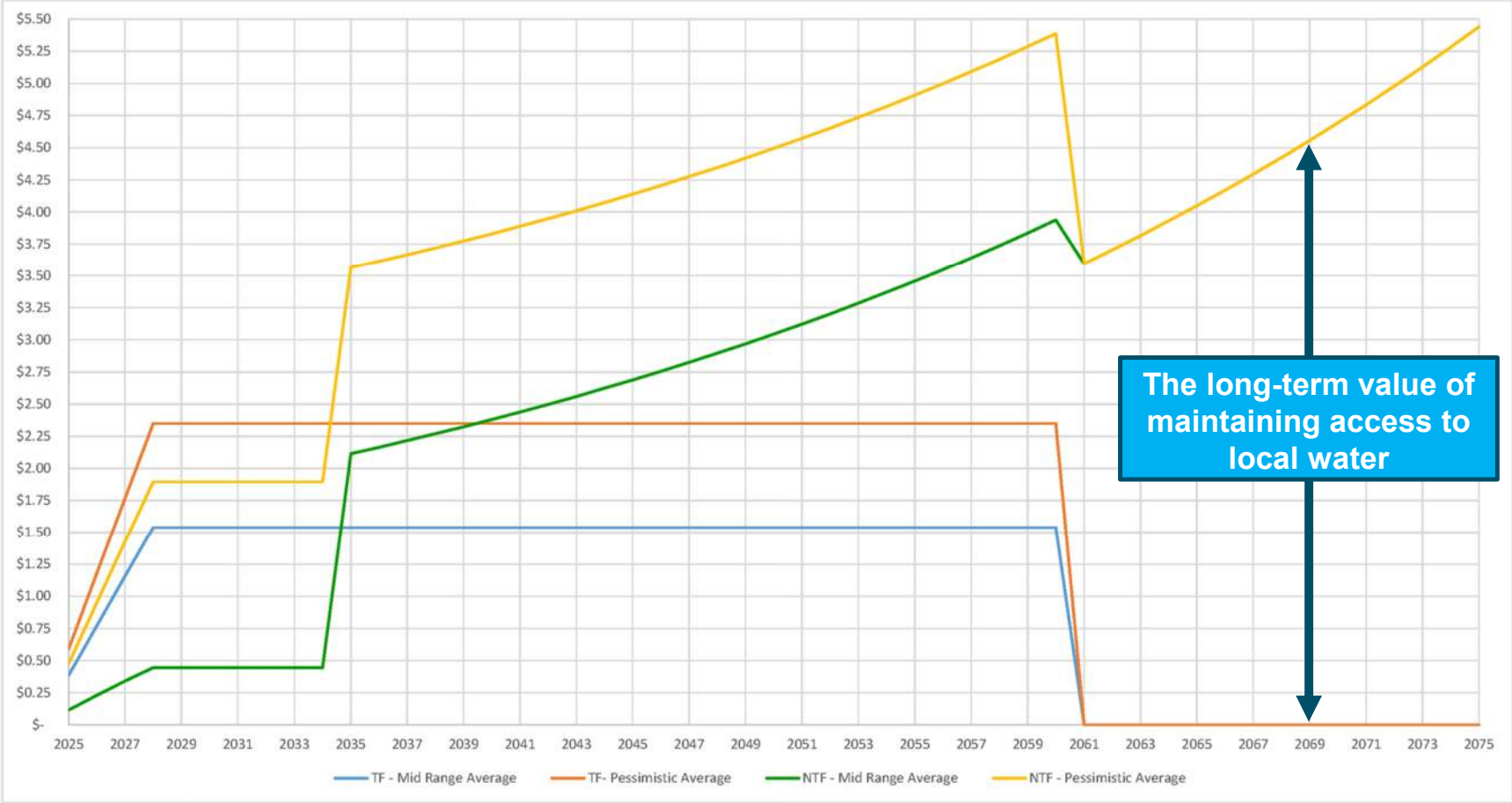
- TF Scenario:**
1. Y-axis represents the impacts to unit water rates caused only by implementing TF; irrespective of other capital needs, passthroughs, ect.
 2. Mid-range scenario uses plausible funding strategy (bonds, loans, grants)
 3. Pessimistic scenario uses worst-case funding strategy (bonds only)
 4. Rates increase \$2.40 over 3-years during planning and design
 5. Rates flatten and hold during 30-year loan period
 6. TF's rate impact declines after loan is paid off to zero if no other capital needs arise



E. Effects of TF & NTF Projects on Customer Rates



E. Effects of TF & NTF Projects on Customer Rates



3. Conclusions & Next Steps

Speaker: J.P. Semper, P.E.



Defining the **next**

legacy



Summary of Conclusions: Phase 4 – Fine Screening

1. The Alignment Study has finished evaluating a broad range of alternatives and **recommends Alternative 1 advance to conceptual design**, while retaining the Beginning corridor of Alternative 2 as a contingency during final design.
2. The **Flume Replacement Project requires a diverse funding portfolio**; interest rates for the funding mechanisms which will plausibly comprise this portfolio have increased significantly.
3. **Most climate futures, 80% of the modeled scenarios**, predict the District can confidently rely on local water being available over a wide variety of climate conditions, and the economics **weigh in favor of a To Flume project if modest investments are made to the LWS**.
4. The **To Flume option retains significant cost advantage** in comparison to the Not To Flume option, and still supports LWS improvements at Lake Henshaw and Warner Basin wellfield; **so long as the District's share of average annual local yield is above 2,700 AFY**.

Final Conclusion & Next Steps



RELIABLE



AFFORDABLE



RESPONSIBLE

5. The **analyses presented herein supports the District's continued investment** in HABs mitigation, wellfield improvements, and the future Flume Replacement project. Recommended next steps include:

- A. Proceed with Phase 5 – Recommended Alignment Report.
- B. Inform DDW of the District's intent to advance the Flume's replacement.
- C. Advance preparation of CEQA supporting documents.
- D. Continue investigating HABs mitigation and wellfield optimization.
- E. Work with the District's Municipal Advisor to develop the project's funding strategy.
- F. Develop an RFP for the final design of the Flume Replacement Project.
- G. Use the planning, environmental, and financial documents prepared in the above steps as supporting documentation to pursue a diverse funding portfolio.

Thank you.
Questions?